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FRENCH THESARUS ON ATMOSPHERIC POLLUTION

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Research Triangle Park, North Carolina

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FRENCH THESAURUS ON ATMOSPHERIC POLLUTION
[Le thésaurus de la pollution atmosphérique en langue francaise]

by

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The thesaurus on atmospheric pollution, the first edition of which was published in September 1973, was initiated and directed by the CITEPA and prepared by a cooperative effort of the main French organizations involved in study and documentation of atmospheric pollution. The names of the contributing organizations are given in App. 1.

An assist was given by the DGRST [Direction générale de recherche scientifique et technique; General Scientific and Technical Research Administration] under the auspices of the National Bureau of Scientific and Technical Information and with the consent of the appropriate divisions of the Ministry for Protection of Nature and the Environment.

The thesaurus consists of a large number of French terms (2500), standardized and arranged, representative of special fields of interest and information

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needs relating to atmospheric pollution -- pollutants, sources of pollution, measurement, dispersion, means of prevention, and effects of pollution -- in their technical, economic and legal aspects.

The designated purpose of this thesaurus is "to increase the efficiency of French information systems, aiding their automation in some cases, to establish a common language in order to build up an information network and to work more easily with foreign information systems." The design, organization and preparation of this thesaurus toward these goals will be discussed in the following.

After an explanation of the goals of the project, this article will examine the principles followed to obtain a strict, unambiguous and up-to-date documentary language. The decision was to use preferred or "descriptive" terms, and their synonyms, the "unused" terms, are also given. The descriptors have been placed under basic conceptual headings which clarify their meaning and the logical relationships between terms have been established in order to clarify the semantic content; the terms have also been grouped according to the different fields of interest of atmospheric pollution.

The various entries provided to facilitate use of the thesaurus will be given: an alphabetical list of the terms and their relationships, a list of descriptors by conceptual heading and a list by field of interest.

The method of preparation of this work will be described; the advantages of a cooperative effort show up very clearly at each stage of the project, from the collection of terms through their selection and organization, up to preparation of the lists making up the final thesaurus.

I. Goals

A number of goals have been kept in mind in preparing this thesaurus.

1.1. To Increase the Efficiency of Information Systems Dealing with Atmospheric Pollution

This will be done by facilitating and improving the identification of information, infosearch and the distribution of information to interested parties.

It might be noted briefly that "the purpose of any information system is to ensure a flow of information from a document (in the broadest sense of the term) to a requestor." The following diagram, taken from a brochure [1] on the rules of thesaurus preparation edited by the BNIST, shows the role and the importance of the documentary language used in operating such systems.

The thesaurus provides an intermediate documentary language between the level of classification -- the most systematic form of documentary language, providing a logical classification of concepts but lacking flexibility for interrogation of the system, and especially difficult to open up for use -- and that of the use of the natural language of the documents or requestors -- a basically dynamic and flexible means allowing fast direct access to the concepts sought, but one giving rise to ambiguities of all types inherent in the nature of the language (synonymity, polysemia, etc.). This intermediate language is at once flexible, precise and rigorous, and especially well suited to the handling of information on atmospheric pollution.

An article published in the October-December 1973 issue, "French methods for information and documentation on atmospheric pollution" [2], has shown the main characteristics for information required in the study of atmospheric pollution problems.

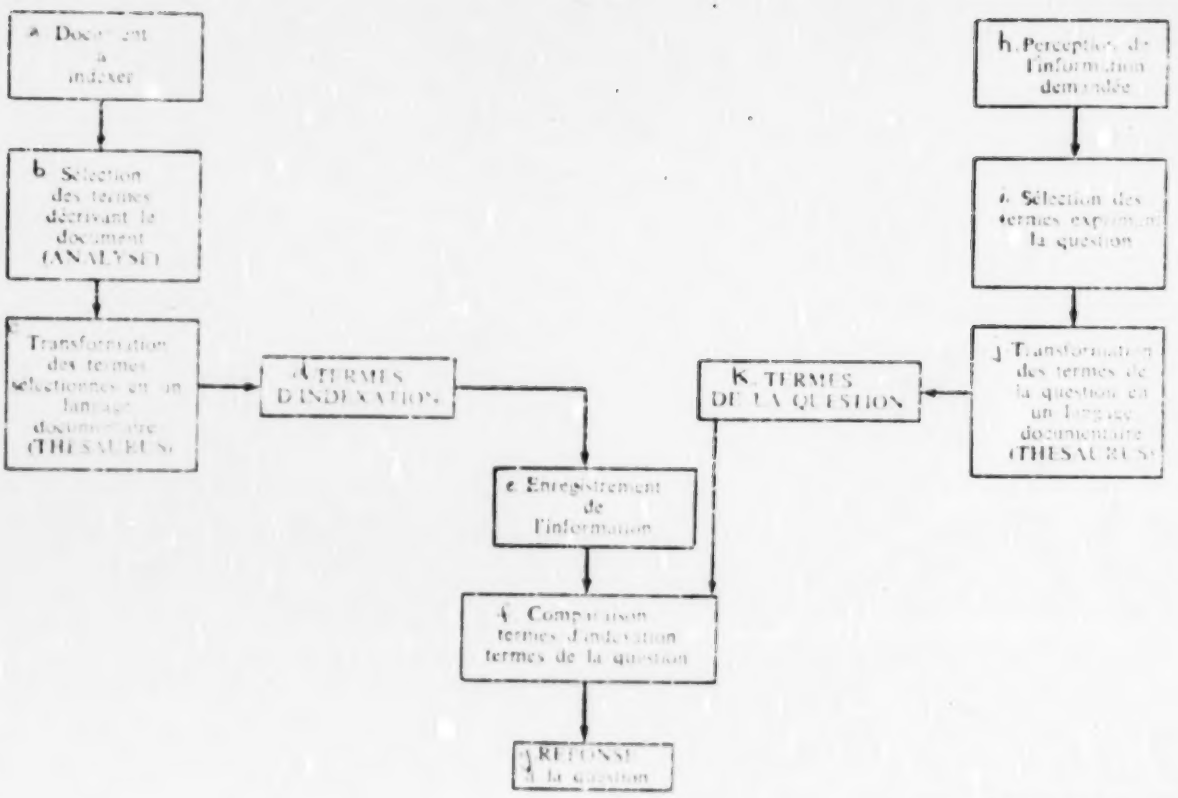
a. Document à indexer
b. Sélection des termes décrivant le document (ANALYSE)
c. Transformation des termes sélectionnés en un langage documentaire (THESAURUS)
d. TERMES D'INDEXATION
e. Enregistrement de l'information
f. Comparaison termes d'indexation termes de la question
g. RÉPONSE à la question
h. Perception de l'information demandée
i. Sélection des termes exprimant la question
j. Transformation des termes de la question en un langage documentaire (THESAURUS)
k. TERMES DE LA QUESTION

Fig. 1.

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Key: a. Document to be indexed.
b. Selection of terms describing the document (analysis).
c. Conversion of terms selected into documentary language (thesaurus).
d. Indexing terms.
e. Recording of information.
f. Comparison of indexing terms with terms of question.
g. Answer to question.
h. Recognition of information requested.
i. Selection of terms expressing the question.
j. Conversion of terms in question into documentary language (thesaurus).
k. Terms in question.

This information basically involves several disciplines, and the documentary language which will be used to exploit this information must be flexible and not subject to logical structuring within the disciplines; in addition it must be able to integrate information from widely separated areas.

The field of pollution and the information needs involved, arising from a wide variety of requestors, change very quickly. The terminology of the

documents and requestors is still somewhat hazy, resulting in the need for a documentary language such as that of the thesaurus, offering a choice of strict, precise terms which will channel this terminology. In addition, the relative ease of display of this language, which can be obtained without disorganizing its structure, will make it possible to alter it to meet changes in the field and its needs.

So far we have been assuming an information system using the thesaurus as its language. Even if the natural language is used by an information system, a controlled documentary language like that of the thesaurus will be extremely valuable in preparing research strategies to avoid the pitfalls of natural language and to relocate the terms which may have been used for the information input.

1.2. To Contend with the Increasing Mass of Information on Atmospheric Pollution By Using Automated Systems

The thesaurus as a documentary language is especially well suited to the rational use of data processing methods, if necessary, in a field such as atmospheric pollution, where there is a constantly increasing mass of information. Inversely, a thesaurus could also be used in a non-automated information system, with the use of a computer to exploit all the possibilities of this system fully.

1.3. To Establish a Common Language Usable by All French Information Centers Dealing with Atmospheric Pollution

It is important to set up a common language in order to coordinate French information systems on air pollution [2] and to set up an information network.

The thesaurus on atmospheric pollution should facilitate the establishment of a central store of information by direct contributions from several information centers, which will identify their information with the same language, and should permit these centers to interrogate this store of information directly.

Its structure should be flexible enough for it to be used by a large number of centers engaged in various operations; its rigor and precision should ensure a given uniformity during use.

I.4. To Facilitate Access to Foreign Information Systems

Since atmospheric pollution problems are not confined to any one country, it is extremely valuable to be able to obtain information stored in foreign information systems, which frequently are more extensive than our own (especially in the U.S.).

Currently, information from foreign systems must be reprocessed if it is to be integrated into our own systems. If the foreign center is dealt with directly there are not only time problems, but also difficulties in matching the two languages.

If comprehension were possible at the outset, and the relationship between the two languages could be studied by means of a controlled, flexible and rigorous documentary language such as that of a thesaurus, it would be conceivable to interrogate these foreign systems directly in their own language by means of terminals connected to their central store.

The French thesaurus on atmospheric pollution, which has drawn on the American thesaurus put out by the APTIC, could provide the foundations for a multilingual thesaurus.

2. Design and Organization

The thesaurus on pollution was designed and organized so as to offer the precision, rigor and flexibility required by the goals selected.

The principles used to this effect have been tested in the preparation of previous thesauruses such as the "Petroleum" [5] or "Energy Conservation" thesauruses. They were found to be in conformity with the international rules for thesaurus preparation set up by the ISO [3] and re-stated in an AFNOR experimental standard [4].

2.1. Determination of "Descriptors" and Unused Terms

The 2500 terms in the thesaurus on atmospheric pollution include some, the "descriptors" (1800), designated for the identification of information and formulation of questions, while others, true synonyms or terms used as synonyms of the former, are unused terms or "non-descriptors" (700).

This operation of selecting descriptors and non-descriptors is essential to the accuracy and rigor of the language established. By only allowing the necessary and adequate number of descriptors to cover the range considered, one avoids any redundancy (use of different terms for a single concept) and any omissions in indexing documents or questions.

In addition, qualificatives or explanatory notes have been provided in some cases to clarify the meaning of the descriptor or its mode of use.

Examples of qualificatives:

CONTROL (process)

CONTROL (prevention)

CONTROL (governing)

CONTROL (monitoring)

CYCLONE (deduster)

CYCLONE (meteorology)

CYCLONE (process)

Examples of explanatory notes:

EFFECT ON ANIMAL

** not including experimentation with animals

DRIVE [Fr. "entrainement"]

** applied to a device, not in the sense of dispersion

INDUSTRIAL EFFLUENT

** "effluent" may be used with an adjective describing the type of industrial installation

REDDISH SMOKE

** with the exception of nitrous vapors

Definitions taken from official terminology may be included in the thesaurus:

SMOKE: term generally denoting the particles carried by combustion gases (soot, airborne particles, smoke from incomplete combustion of organic material, vesicles) (AFNOR Standards X 43 001).

Some of the rules of composition given by the French standardization project have been adopted: preferential form of descriptors, singular substantives, elimination of prepositions, articles and punctuation except in cases of ambiguity, use of abbreviations, etc.

2.2. Establishment of Relationships Between Terms

The interwoven relationships of a descriptor to the other terms in the thesaurus tends to reduce the risk of ambiguity by locating the descriptor in a semantic field which constitutes a sort of definition.

Three types of relationships, all of them reciprocal, have been set up: equivalence relationships, hierarchical relationships, and associative relationships.

2.2.1. Equivalence Relationships

This relationship refers various synonyms or quasi-synonyms of a concept in normal language to the single corresponding descriptor used in the thesaurus.

Examples: EM indicates the term selected as the descriptor.

EP indicates the unused term.

HYPERSENSITIVITY EM ALLERGY

SHOCK DEDUSTER EM INERTIA DEDUSTER

FILTERING MATERIAL EM FILTERING MEDIUM

Some cases may involve synonyms which are much more arbitrary for the needs of classifying documentary terms:

TOXICITY EM NOCIVITY

ANALYSIS EM GRANULOMETRY

or, presented in reverse order:

PLUME SHAPE EP CONING

EP FANNING

EP LOFTING

EP LOOPING

EP TRAPPING

2.2.2. Hierarchical Relationships

The hierarchical relationships express the superiority and subordination of the concepts included in the thesaurus [5].

The specific terms ST denote the finest divisions of a descriptor:

SAMPLING

ST TRAPPING

ST AMBIENT AIR SAMPLING

ST CONTINUOUS SAMPLING

ST DISCONTINUOUS SAMPLING

ST EMISSION SAMPLING

TROPOSPHERE

ST LOW ATMOSPHERE

ST MEDIAN ATMOSPHERE

The generic terms GT denote the widest term covered by the descriptor. When this generic term also has a generic term, the latter is given below the former, as well as the third generic term, if there is one. Thus it is possible to take in the entire hierarchical chain of a descriptor at a single glance.

CYCLONE DEDUSTER

GT CENTRIFUGAL FORCE DEDUSTER

GT MECHANICAL DEDUSTER

GT DEDUSTER

GT AERAULIC SEPARATOR

COMBUSTION GAS

GT GASEOUS EFFLUENT

GT EFFLUENT

GT WASTE

These hierarchical relationships make up the skeleton of the thesaurus and permit literature search at different levels of specificity.

For example, it should be possible to locate a document dealing with a specific concept, for example (pollution by) BESSEMER CONVERTER, by asking a question on a more general level, (pollution by) METALLURGICAL FURNACE:

BESSEMER CONVERTER

GT STEEL FURNACE

GT METALLURGICAL

Inversely, from a very specific question on "dust fallout" it should be possible to find the more general corresponding concept "solid particle."

Strict rules were observed in setting up the hierarchical relationships.

Most importantly, relationships were not established between descriptors belonging to the same conceptual grouping.

These groupings are based on the definition of a basic common characteristic allowing the vocabulary to be divided in as exclusive a manner as possible.

The conceptual groupings used to hierarchize the thesaurus on atmospheric pollution are common to a large number of standardized thesauruses which are currently available or under preparation:

OPERATING CONDITIONS

EQUIPMENT

COMMON FACTORS

ECONOMIC FACTORS

LEGAL FACTORS

MATERIALS

PHENOMENA

PROCESSES

PROPERTIES

SCIENCES AND TECHNOLOGY

GROUND AND SPACE

Some of these may be divided into subgroupings, for example:

MATERIAL by CHEMICAL ASPECTS

MATERIAL by COMPOSITION

MATERIAL by STRUCTURE

Each descriptor in the thesaurus has thus been placed in a conceptual grouping matching its characteristic nature and is generally located in only one of these groupings. Thus only one generic term will apply to it.

When this was not the case, it was often possible to break a word down into the concepts it included and to place each of these concepts in its appropriate hierarchy [5].

It is easy to see how the rigor of the rules of hierarchization followed made it possible to perform an in-depth analysis of the descriptors and to remove any ambiguity from their meaning.

Furthermore, the fact that this hierarchy was set up without reference to specific themes or disciplines increases the chance that this thesaurus will be compatible with similar thesauruses based on the same principles.

Finally, due to the rigor of the hierarchical chains, it should be possible to set up an automated information system which would include automatic generation of a specific generic relationship.

Examples of hierarchical relationships:

The descriptors:

ACID

ST MINERAL ACID

ST ORGANIC ACID

are part of the conceptual grouping MATERIALS BY CHEMICAL ASPECTS, while the descriptors:

NITROUS ACID

NITRIC ACID GT MINERAL COMPOUND

SULFURIC ACID

or:

BENZOIC ACID

GT ORGANIC COMPOUND

PHTHALIC ACID

are part of the conceptual grouping MATERIAL BY COMPOSITION.

Similarly, POLLUTANT

ST AIR POLLUTANT

ST WATER POLLUTANT

ST GASEOUS POLLUTANT

is considered a MATERIAL BY FUNCTION and does not generate possibly pollutant chemical constituents of this substance, which are included in the grouping MATERIAL BY COMPOSITION.

The terms WASTE INCINERATOR or DISCHARGE INCINERATOR come under the heading EQUIPMENT, while WASTE TREATMENT or WASTE INCINERATION come under the heading PROCESS.

2.2.3. Associative Relationships

The associative relationship is used to indicate connections between terms which are useful in indexing documents or questions and which cannot be covered by equivalence or hierarchical relationships.

The associative relationship covers an entire series of varied relationships (similarity, difference, whole/part, dissuasion, proximity, etc.). These are denoted by the abbreviation VA.

Examples:

EPIDEMIOLOGY

VA MORBIDITY

VA MORTALITY

MEASUREMENT

VA SAMPLING

VA MEASUREMENT NETWORK

VA MEASUREMENT RESULT

VA SELECTIVITY

VA SENSITIVITY

MODEL

VA SIMULATION

2.3. Study of Descriptors in Relation to the Various Fields of Interest of Atmospheric Pollution

The field of atmospheric pollution has been divided into ten areas of interest fairly close to those used in the American thesaurus put out by the APTIC.

The diagram given in App. 2 shows these ten areas, which have been more or less finely subdivided.

Each descriptor has been placed in one or several of these areas, making it possible to situate it within the context of atmospheric pollution. Inversely, the different areas of pollution are defined by the terms which they include. It was possible to avoid a large number of associative relationships in this way.

2.4. The Lists in the Thesaurus and Their Respective Usefulness

Three types of entries have been provided to facilitate use of the thesaurus:

-- an alphabetical list of terms and their relationships.

-- a list of descriptors by conceptual system.

-- a list of descriptors by field of interest.

Samples from these lists are given in App. 3.

2.4.1. Alphabetical List of Terms and Their Relationships

This includes all the terms in the thesaurus, both descriptors and non-descriptors. Below each term are listed the equivalence, hierarchical and associative relationships which characterize it, with an indication of the applicable explanatory notes where necessary.

This list will be used to check to see that the characteristic concepts drawn from a document or question are included in the thesaurus as descriptors.

If this is the case, the relationships given under the descriptor will make it possible to locate other descriptors which better express given aspects of the document or question, for example: more accurate indexing due to a specific list of descriptors, or the use of the list of related descriptors to uncover a concept not indicated by the requestor.

In all other cases, consultation of the alphabetical list will serve to check the exact meaning of the descriptors used.

2.4.2. List of Descriptors by Field of Interest

For each field of interest or subdivision of a field (diagram of fields of interest in App. 2), the descriptors are classified by alphabetically, followed by specific terms falling within the same field.

An alphabetical list of all descriptors with an indication of the field(s) of interest in which they are included has been set up.

This list will be especially useful in cases where characteristic concepts drawn from the document or question do not appear in the thesaurus. With the use of the fields of interest diagram it will be possible to determine the field in which these concepts should be included, and then by consulting the list of descriptors included in this field it will be possible to translate the concepts used into the terms of the thesaurus.

In addition, consultation of the list by field of interest will constitute a guide for selecting the characteristic concepts of a given document or question when these are difficult to determine.

2.4.3. List of Descriptors by Conceptual Grouping

For each of the conceptual groupings used (cf. list of these groupings, p. 11), the descriptors are classified by their hierarchical level, from the most general to the most specific, and in alphabetical order within a given hierarchical level. This is a reflection of the internal structure of the thesaurus.

An alphabetical list of descriptors with reference to the corresponding conceptual grouping has been set up.

If necessary, this list will be consulted after the descriptors expressing the characteristic concepts of the document or question have been located, to remove any ambiguity in the meaning of the descriptors selected by situating them in their conceptual grouping and their hierarchical chain.

3. Method of Preparation

Three years of research were necessary to prepare the thesaurus on atmospheric pollution, from the end of April 1970, when the decision to prepare the thesaurus was made, through September 1973, when an initial version was presented.

The stages of research performed over these three years included setting up a team representative of the field of atmospheric pollution and corresponding information needs, the collection of terms, the choice of descriptors and non-descriptors, organization of these terms and the establishment of the lists making up the thesaurus.

3.1. Research Team

Organizations representing the various fields of atmospheric pollution and the various categories of information needs were kind enough to delegate specialists to prepare this thesaurus as a joint effort.

All of the work performed was subject to the approval of the participating organizations.

A representative of the Permanent Committee for Coordination of Thesauruses of the National Bureau of Scientific and Technical Information monitored the various phases of preparation of the thesaurus to ensure its conformity with national and international specifications being prepared and its compatibility with other standardized French thesauruses, both available and under preparation.

A look at the composition of the research team (given in App. 1) will show the variety and complementary nature of the organizations and individuals concerned: orientation centers dealing with all types of atmospheric pollution information (CNRS [Centre national de recherche scientifique; National

Scientific Research Center], APPA [Association pour la prévention de la pollution atmosphérique; Association for the Prevention of Atmospheric Pollution]), more specialized study and documentation centers within a given field (CEA [Commissariat à l'energie atomique; Atomic Energy Commission], CERCHAR [Centre d'études et recherches des charbonnages de France; Center for Study and Research on Coal Mining in France], CETIAT, CFDE, CITEPA, INSERM [Institut national de la santé et de la recherche médicale; National Institute of Health and Medical Research], IFP [Institut francais du pétrole; French Petroleum Institute], UTAC [Union technique de l'automobile, du motocycle et du cycle; Automobile, Motorcycle and Cycle Technical Association]), specialists in problems of pollution and neighboring fields, specialists in literature handling, experts on thesauruses, data processing experts, etc.

3.2. Collection of Terms

The main sources of terms available were the following:

-- terms included in the American thesaurus put out by the APTIC, translated into French by the CITEPA (1300).

-- terms drawn from the quadrilingual glossary project of the OCDE [Office du crédit pour le développement économique; Credit Office for Economic Development] (English-German-French-Italian) (1100).

-- pollution terms used by the STEPPA-CEA Fontenay (1000).

-- pollution terms used by the CERCHAR (500).

-- pollution and health terms used by the INSERM-CRPA (1000).

A combined alphabetical list of all these terms (5000) with notes on their origin and the existing English equivalent has been set up and has served as the basic material in preparing this thesaurus.

It may be noted that almost all the languages have already been controlled, which has been an advantage in the work of selection and structuring, but a drawback as to compatibility with natural language.

3.3. Choice of Descriptors and Non-Descriptors

The choice of descriptors and non-descriptors from the first combined list of terms and the addition of new terms where necessary were performed at monthly meetings of all participants (11 meeting of four hours each over a year's time).

A specialist in the area concerned gave his opinion on each term: frequency of use of the term in technical literature, scientific or technical value, degree of specificity or generality and usefulness for indexing and document search; where necessary, this specialist would furnish a definition of this term or an explanatory note.

Choices which had already been made for existing or forthcoming thesauruses in neighboring fields were also taken into account.

As the work progressed, successive computer runthroughs furnished alphabetical lists of the terms selected with their origins.

The complete list of all terms was checked by each of the participants.

3.4. Organization of Terms

The structuring of the thesaurus, which included checking equivalence relationships, placing descriptors in their corresponding conceptual groupings, establishing hierarchical relationships and determining associative relationships, was entrusted to a limited team which communicated with the different specialists involved.

Similarly, this team regrouped the descriptors by field of interest.

This work of organization, which lasted two years, was monitored by all the participants.

3.5. Establishment of Lists

The thesaurus preparation program developed on the CDC 6600 computer by the French Petroleum Institute permitted the systematic control and organization of the thesaurus (automatic generation of inverse or complementary relationships, detection of errors and inconsistencies in the internal structure of the thesaurus, etc.) and the production of the alphabetical list of terms and their relationships and lists by conceptual grouping.

Three separate passes through the computer were necessary to obtain this first edition.

The question remains, whether the thesaurus on atmospheric pollution will make it possible to reach the initial goals set: improvement of the operation of documentary systems, automation of some of these systems, adoption of a common language so as to set up national and international information networks resulting in improved knowledge and distribution of information on atmospheric pollution.

The answer to this question will come from the use made of this thesaurus over the next three to four years. Only in this way will it be possible to test and improve this tool and to adapt it to developments in the field of atmospheric pollution and information needs.

This long and difficult project has further provided an opportunity for French atmospheric pollution studies information centers to get better acquainted and learn to work together.

This project has revealed the amount of cooperation necessary to prepare a thesaurus. Although this method may have seemed to slow the progress of

the research in some cases, due to the total skills and means of all types combined in this way it has made it possible to set up a valid documentary language representative of the field of atmospheric pollution and information needs which is acceptable to all parties, since it has been jointly prepared.

In addition, to step beyond the limits of information systems, the strict reference terminology of this thesaurus, its overview of the field of atmospheric pollution research and its cross-references may make it useful to any responsible party or user wanting to know more about this field.

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Appendix 1. Commission Members

APPA	Mr. Casset
CEA Grenoble	Mr. Dumont
CEA Saclay	Mrs. Dirian
CEA-STEPPA	Mr. Chevalier
	Mrs. Thal
CERCHAR	Mr. Seelemann
CETIAT	Miss Prod-homme
CFDE	Mr. Gousset
CITEPA-IFCE	Mrs. Jarrault
CNRS	Mrs. Delmas
	Mr. Marlot
	Mrs. Porcheron
INSERM (CRPA)	Prof. Roussel
UTAC (CAPA)	Mrs. Levitt

Work Group

CITEPA	Mrs. Jarrault
CNRS	Mrs. Delmas
	Mr. Dubois
	Mr. Marlot

Contributions in specialized areas:

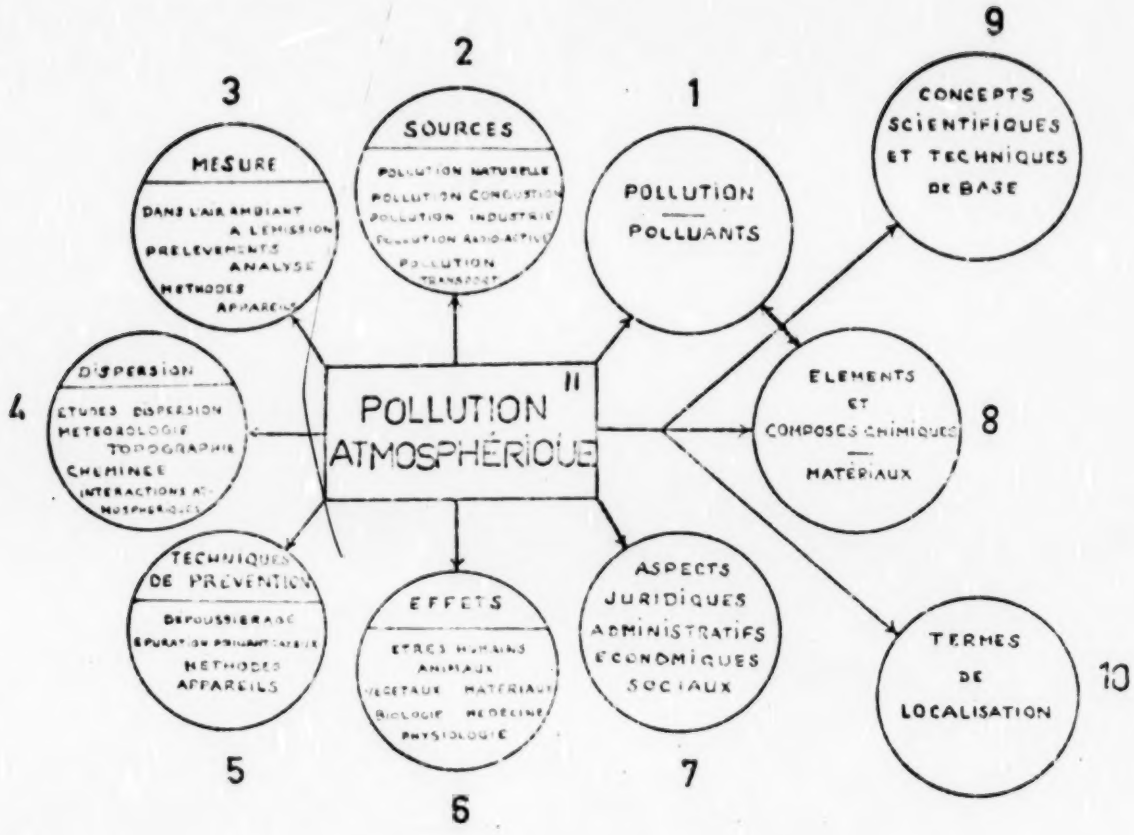
Effects on health:

CNRS	Mrs. Dubois
	Mrs. Menillet
	Mrs. Pichon
	Mrs. Rebeillard

INSERM	
-- CRPA	Prof. Roussel
-- Unit Group 122	Prof. Boudene
Legal aspects:	
CFDE	Mr. Gousset
Chemical terms:	
CNRS	Miss Durin
	Mrs. Marteau
	Mrs. Porcheron
Processing of material on computer:	
CERCHAR	Mr. Seelemann
I.F.P.	Mrs. Moureau
	Mr. Delaunay

Thesaurus preparation program.

Appendix 2. Diagram of Fields of Interest



Key: 1. Pollution and pollutants.
2. Sources: natural pollution, pollution from combustion, industrial pollution, radioactive pollution, vehicle pollution.
3. Measurement: in the ambient air; at emission site; sampling; analysis; methods; equipment.
4. Dispersion: dispersion studies, meteorology, topography, stacks, atmospheric interference.
5. Prevention techniques: dedusting; purification of gaseous pollutants; methods; equipment.
6. Effects: human beings, animals, vegetables, materials; biology, medicine, physiology.
7. Legal, administrative, economic and social aspects.
8. Elements and chemical compounds; materials.
9. Basic scientific and technical concepts.
10. Pinpointing terms.
11. Atmospheric pollution.

Appendix 3.

Sample of List by Field of Interest (2.4.2.)

1. Pollution and pollutants[1]

1.1. Nuisances and pollution

NOISE
SEVERE EPISODE ATMOS. POLL.
NUISANCE
  POLLUTION
    ATMOSPHER. POLLUTION
    WATER POLLUTION
    WATER POLLUTION
    RADIOACTIVE POLLUTION
    GROUND POLLUTION
    THERMAL POLLUTION
ODOR
SMOG
  OXIDIZING SMOG

1.2. Pollutants

ALLERGENIC
CARCINOGENIC
TRACE COMPOUND
TRACE ELEMENT
TOBACCO SMOKE
UNBURNED
CARBON BLACK
PHOTOCHEMICAL OXIDANT
PARTICLE
  PARTICLE IN SUSPENSION
  LIQUID PARTICLE
    DROP
  SOLID PARTICLE
    CINDER
      AIRBORNE CINDER
    AIRBORNE PARTICLES
  SMOKE
    BLACK SMOKE
    RED SMOKE
  HALF-BURNED ORGANIC MATERIAL
  POWDER
  DUST FALLOUT
  SOOT
  SOOT FALLOUT
POLLUTANT
  AIR POLLUTION
  GASEOUS POLLUTION
OXIDIZING PERCURSOR
SOLVENT
  AEROSOL
    MONODISPERSED AEROSOL
    POLYDISPERSED AEROSOL
    MIST

1.3. Radioactive Pollutants

RECOIL ATOM
ACTIVE DEPOSIT
DAUGHTER PRODUCT
FISSION PRODUCT
RADIOACTIVE PRODUCT
RADIOACTIVE ELEMENT
RADIOACTIVE FALLOUT

1.4. Pollutants of Natural Origin

"AMBROSIA"
MARINE SPRAY
MICROORGANISM
  ACTINOMYCETE
  BACTERIA
  LOWER MUSHROOM
  VIRUS
POLLEN
VEGETABLE DUST
SPORE

1.5. Pollutants Related to Agriculture

DDT
FERTILIZER
FERTILIZER
PESTICIDE
  DEFOLIANT
  FUNGICIDE
  HERBICIDE
  INSECTICIDE
  ORGANOCHLORINE PESTICIDE
  ORGANOPHOSPHORUS PESTICIDE
PHYTOTOXIC

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[1] See also: sources of atmospheric pollution and elements and chemical compounds.

Extract from Alphabetical List of Terms and Their Relationships (2.4.1.)

DEDUSTER
ST COMBINED DEDUSTER
ST POROUS LAYER DEDUSTER
ST CYCLONE DEDUSTER
ST ELECTRICAL DEDUSTER
ST STACK DEDUSTER
ST CENTRIFUGAL DEDUSTER
ST GRAVITY DEDUSTER
ST INERTIA DEDUSTER
ST MECHANICAL DEDUSTER
ST ULTRASONIC DEDUSTER
ST WET DEDUSTER
ST AIR INTAKE FILTER
GT AERAULIC SEPARATOR
GT SEPARATING EQUIPMENT
VA ANTIPOLLUTION INDUSTRY
VA AERAULIC THERMAL INDUSTRY
VA SHAKING
VA PHYSICAL SEPARATION
SHOCK DEDUSTER
EM INERTIA DEDUSTER
COMBINED DEDUSTER
GT DEDUSTER
GT AERAULIC SEPARATOR
GT SEPARATING EQUIPMENT
FIBROUS LAYER DEDUSTER
EM AIR INTAKE FILTER
POROUS LAYER DEDUSTER
ST STACK DEDUSTER
ST AIR INTAKE FILTER
GT DEDUSTER
GT AERAULIC SEPARATOR
GT SEPARATING EQUIPMENT
VA FILTER
CYCLONE DEDUSTER
EP CYCLONE (DEDUSTER)
EP MULTICYCLONE
GT CENTRIFUGAL DEDUSTER
GT MECHANICAL DEDUSTER
GT DEDUSTER
GT AERAULIC SEPARATOR
GT SEPARATING EQUIPMENT
VA CYCLONE (PROCESS)
ELECTRIC DEDUSTER
EP ELECTROSTATIC DEDUSTER
EP ELECTRIC FILTER
EP ELECTROSTATIC FILTER
GT DEDUSTER
GT AERAULIC SEPARATOR
GT SEPARATING EQUIPMENT
VA RING EFFECT
VA STATIC ELECTRICITY
VA ELECTRODE
VA RESISITIVITY
VA VOLTAGE
ELECTROSTATIC DEDUSTER
EM ELECTRIC DEDUSTER
STACK DEDUSTER
EP SCREEN FILTER
GT POROUS LAYER DEDUSTER
GT DEDUSTER
GT AERAULIC SEPARATOR
GT SEPARATING EQUIPMENT
VA GRAVEL BED
CENTRIFUGAL DEDUSTER
*DEDUSTER BY CENTRIFUGAL FORCE
ST CYCLONE DEDUSTER
GT MECHANICAL DEDUSTER
GT DEDUSTER
GT AERAULIC SEPARATOR
VA CENTRIFUGATION
GRAVITY DEDUSTER
EP BAFFLE CHAMBER
EP SEDIMENTATION CHAMBER
GT MECHANICAL DEDUSTER
GT DEDUSTER
GT AERAULIC SEPARATOR
GT SEPARATING EQUIPMENT
VA GRAVITY DEPOSIT
HYDRAULIC DEDUSTER
EM WET DEDUSTER
INERTIA DEDUSTER
EP CONE WITH GRATING
EP SHOCK DEDUSTER
GT MECHANICAL DEDUSTER
GT DEDUSTER
GT AERAULIC SEPARATOR
GT SEPARATING EQUIPMENT
VA GRAVITY DEPOSIT
MECHANICAL DEDUSTER
ST CYCLONE DEDUSTER
ST CENTRIFUGAL DEDUSTER
ST GRAVITY DEDUSTER
ST INERTIA DEDUSTER
GT DEDUSTER
GT AERAULIC SEPARATOR
GT SEPARATING EQUIPMENT

ULTRASONIC DEDUSTER
  GT DEDUSTER
  GT AERAULIC SEPARATOR
  GT SEPARATING EQUIPMENT
  VA ULTRASOUND
WET DEDUSTER
  EP HYDRAULIC DEDUSTER
  EP HYDROCYCLONE
  GT DEDUSTER
  GT AERAULIC SEPARATOR
  GT SEPARATING EQUIPMENT
  VA RESIDUAL SLUDGE
  VA WASHER
  VA WATER CURTAIN
  VA VENTURI
DEPREDATION
  EM DAMAGE (MATERIAL)
DERMATOSIS
  EM SKIN DISEASE
UNOILING
  GT PHYSICAL SEPARATION
  VA DEVESICULATOR
DEHYDRATION
GLUTAMIC DEHYDROGENASE
  EM DEHYDROGENASE GLUTAMATE
LACTIC DEHYDROGENASE
  EM DEHYDROGENASE LACTATE

Extract from List of Descriptors by Conceptual Grouping (2.4.3.)

EQUIPMENT

AIRPORT
HEATING DEVICE
MEASUREMENT DEVICE
  ANEMOMETER
  ORSAT DEVICE
  SAMPLING DEVICE
    ELECTROSTATIC SAMPLING DEVICE
    VOL. GR. SAMPLING DEVICE
    INDUSTRIAL SAMPLING DEVICE
    DEPOSIT GAUGE
    COLD TRAP (SAMPLING DEVICE)
    PETROLATED PLATE
    DIEM PLATE
    THERMAL PRECIPITATOR
    SAMPLING PROBE
      ISOKINETIC PROBE
  SF DEVICE
  SEDIMENTATION SCALE
  BAROMETER
LEAD PEROXIDE CANDLE
PARTICLE COUNTER
    AITKEN COUNTER
    COULTER COUNTER
    OWENS COUNTER
    POLLAK COUNTER
CONIMETER
FLOWMETER
DRAEGER DETECTOR
DYNAMOMETER
HYGROMETER
INTERFEROMETER
OLFACTOMETER
OPACIMETER
OPTICAL RADAR
RADIO PROBE
THERMOCOUPLE
THERMOMETER
TYNDALLOMETER

PORTABLE DEVICE
METEOROLOGICAL BALLOON
BUBBLER
BUILDING
BURNER
  GAS COMBUSTION BURNER
  LIQUID COMBUSTION BURNER
  SOLID COMBUSTION BURNER
  POLYCOMBUSTION BURNER
  POSTCOMBUSTION BURNER
CONDUIT
CARBURETOR
COMBUSTION CHAMBER
WORK YARD
HEATER
  PAP. RECOVERY HEATER
BOILER ROOM
STACK
EXHAUST MANIFOLD
SMOKE CONDUIT
STORE
  HYDROCARBON STORE
DETECTOR
  ELECTRON CAPTURE DETECTOR
  GAS DETECTOR
  IONIZATION DETECTOR
    FLAME
  RADIOACTIVITY DETECTOR
    GEIGER COUNTER
WARNING DEVICE
SAMPLE
SEWER
ELECTRODE
WATERTIGHT CHAMBER
RECORDING DEVICE
ELECTRICAL EQUIPMENT
  ELECTRICAL ACCUMULATOR
  FUEL CELL
SEPARATING EQUIPMENT
  BATTERY OF DIFFUSERS
  BUBBLING COLUMN
  FURNISHING COLUMN
  PULVERIZATION COLUMN
  FILTER
    FILTERING CANDLE
    ABSOLUTE FILTER
    AIR FILTER
      WET FILTER
      DRY FILTER
    MEMBRANE FILTER
    SOLUBLE FILTER
    PREFILTER
  IMPACTOR
    CASCADE IMPACTOR
  WASHER
    WASH COLUMN
    BUBBLING WASHER
    PULVERIZING WASHER
    VENTURI WASHER
  GRAVEL BED
  AERAULIC SEPARATOR
    DEDUSTER
      COMBINED DEDUSTER
      POROUS LAYER DEDUSTER
        STACK DEDUSTER
        AIR INTAKE FILTER
      ELECTRICAL DEDUSTER
      MECHANICAL DEDUSTER
        CENTRIFUGAL DEDUSTER
          CYCLONE DEDUSTER
        GRAVITY DEDUSTER
        INERTIA DEDUSTER
      ULTRASONIC DEDUSTER
      WET DEDUSTER
    DEVESICULATOR
    GASEOUS POLLUTANT PURIFICATION
  SCREEN
FURNACE
  BONDING OVEN
  LIME KILN
  CEMENT OVEN
  COKE OVEN
  ELECTRICAL FURNACE
    ARC FURNACE
  ROASTING FURNACE
  METALLURGICAL FURNACE
    CUPOLA
    STEEL FURNACE
      BESSEMER CONVERTER
      OXYGEN CONVERTER
      OPEN-HEARTH FURNACE
    ELABORATING FURNACE
    FOUNDRY FURNACE
    BLAST FURNACE